Journal of Applied Pharmaceutical Science

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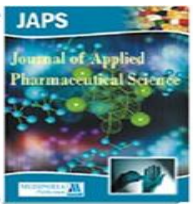

ISSN: 2231-3354
Received on: 18-05-2011
Revised on: 24-05-2011
Accepted on: 28-05-2011

Potential role of Nutraceuticals In Present Scenerio: A Review

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ABSTRACT

Food and drugs from nature place a quite significant role in public healthcare system throughout the world. Nutraceuticals have evolved from the recognition of the link between food and health. Nutraceuticals contain health-promoting ingredients or natural components that have a potential health benefit for the body. Consumer interest in the relationship between diet and health has increased the demand for information on nutraceuticals. Rapid advances in science and technology, increasing health care costs, an aging population and rising interest in attaining wellness through diet are among the factors fueling interest in nutraceuticals. Nutraceuticals currently on the market represent a small fraction of the possible products. The vast potential for functional foods will not be achieved without extensive scientific research to ensure the safety and efficacy of these products.

Key words: Nutraceutical, Nutrients, Herbs, Dietary, Food.

INTRODUCTION

Nutraceuticals (often referred to as phytochemicals or functional foods) are natural bioactive, chemical compounds that have health promoting, disease preventing or medicinal properties. The term 'nutraceutical' was coined in 1979 by Stephen DeFelice , founder and chairman of the Foundation for Innovation in Medicine located in Cranford, New Jersey. It is defined as 'a food or part of food, which provides medical or health benefits, including the prevention and treatment of disease ' (Biesalski *et al.*, 2001). Nutraceuticals may range from isolated nutrients, herbal products, dietary supplements and diets to genetically engineered foods and processed products such as cereals, soups and beverages (Andlauer *et al.*, 2002). With the passage of the Dietary Supplement Health and Education Act of 1994, the definition of nutraceutical has been expanded to include vitamins, minerals, herbs and other botanicals, amino acids and any dietary substance for use by humans to supplement the diet by increasing total dietary intake (Whitman *et al.*, 2001 and Stauffer 1999). The concepts of nutraceuticals, functional or medical foods, or dietary supplements are confusing and most often they can be used interchangeably. These concepts may be distinguished by their description from different points of view, e.g. functional food is a more general term to emphasize foods with specific or strong purposes (Bagchi, 2006 and Koletzko *et al.*, 1998). Dietary supplements have more defined health roles such as vitamins, minerals, herbs or other botanicals, amino acids, and other dietary substances intended to supplement the diet by increasing the total dietary intake of these ingredients (Halsted, 2003). Many fruits, vegetables, grains, fish, dairy and meat products contain several natural components that deliver benefits beyond basic nutrition, such as lycopene in tomatoes, omega-3 fatty acids in salmon or saponins in soy[Figure 1]. Even tea and chocolate have

been noted in some studies to contain health-benefiting attributes (north corolina association 2007). Dietary supplements are not intended to treat or cure disease (Ross, 2000), whereas nutraceuticals more emphasize the expected results of these products, such as prevention or treatment of diseases (Bagchi, 2006 and Zeisel 1999).

NUTRACEUTICAL CATEGORIES

Due to minimal international regulations different types of products fall under the nutraceutical category. Because of this some of them have overlapping definitions. The most usual are herbals, dietary supplements, functional food and products labelled "nutraceutical". These can be grouped into the following three broad categories:-

1. *Nutrients* :- Substances with established nutritional functions, such as vitamins, minerals, amino acids and fatty acids.

2. *Herbals* :- Herbs or botanical products as concentrates and extracts.

3. *Dietary supplements* :- Reagents derived from other sources (e.g. pyruvate, chondroitin sulphate, steroid hormone precursors) serving specific functions, such as sports nutrition, weight-loss supplements and meal replacements (Hathcock, 2001).

PHARMACOLOGICAL ASPECTS OF NUTRACEUTICALS

Numerous nutraceuticals currently are on the market. Table 1 represents a sample of available nutraceuticals, their components and their potential human health benefits (north corolina association, 2007).

Table: 1

Class/Components	Source	Potential benefit
Carotenoids		
1. Beta-carotene	Carrots, various fruits	Neutralizes free radicals, which may damage cells; bolsters cellular antioxidant defenses.
2. Lycopene	Tomatoes and processed tomato products	May contribute to maintenance of prostate health
Dietary Fiber		
Insoluble fiber	Wheat bran	May contribute to maintenance of a healthy digestive tract
Fatty Acids		
Monosaturated fatty acids	Tree nuts	May reduce risk of coronary heart disease
Flavonoids		
Flavonols	Onions, apples, tea, broccoli	Neutralize free radicals, which may damage cells; bolster cellular antioxidant defenses
Isothiocyanates		
Sulforaphane	Cauliflower, broccoli, cabbage, kale, horseradish	May enhance detoxification of undesirable compounds and bolster cellular antioxidant defenses
Phenols		
Caffeic acid, ferulic acid	Apples, pears, citrus fruits, some vegetables	May bolster cellular antioxidant defenses; may contribute to maintenance of vision and heart health
Plant Stanols/Sterols	Fortified table spreads, stanol ester dietary supplements	May reduce risk of coronary heart disease
Stanol/sterol esters		
Polyols		
Sugar alcohols (xylitol, sorbitol, mannitol, lactitol)	Some chewing gums and other food applications	May reduce risk of dental caries (cavities)
Prebiotics/Probiotics	Yogurt, other dairy and nondairy applications	May improve gastrointestinal health and systematic immunity
Lactobacilli, bifidobacteria		
Phytoestrogens		
Isoflavones (daidzein, genistein)	Soybeans and soy-based foods	May contribute to maintenance of bone health, healthy brain and immune functions; for women, maintenance of menopausal health
Soy Protein		
Soy protein	Soybeans and soy-based foods	May reduce risk of coronary heart disease
Sulfides/Thiols		
Dithiolthiones	Cruciferous vegetables	May contribute to maintenance of healthy immune function

MARKET INTEREST OF NUTRACEUTICALS

The nutraceutical market is becoming more competitive with the entry of pharmaceutical and major food companies into the nutraceutical arena. Also, many food companies have established their nutraceutical divisions with a view toward a diversified product line. Pharmaceutical companies have also joined the race by acquiring dietary supplement producers. Recent years have marked the entry of major food and pharmaceutical companies into the nutraceutical marketplace, including Kellogg, Heinz, M&M, Quaker Oats, Unilever, Cargill, Hormel, Glaxo-SmithKline, Warner-Lambert, Johnson & Johnson and Wyeth. The 2004 global nutraceuticals market at the retail level is estimated at approximately $106 billion and is poised to grow at a compounded annual growth rate of 6.0% during 2004–2009 to exceed $140 billion in 2009 (. N. Faisal and K. Sujith Varma).

CURRENT & FUTURE DEVELOPMENTS

Although nutraceuticals have significant promise in the promotion of human health and disease prevention, health professionals and regulatory toxicologists also could strategically work together to plan appropriate regulations to provide the ultimate therapeutic benefits to mankind (north corolina association, 2007 and Taylor, 2004). For manufacturing processes of nutraceuticals, quality controls such as the composition and contents of active constituents in natural plants, and maintenance are critically important. To establish product safety and efficacy, extensive safety studies including acute, subacute, subchronic, chronic and long-term toxicity studies as well as supplementation studies in animals and clinical trials in humans are necessary (Schilter *et al*., 2003 and Kroes *et al*., 2004). The DNA microarray

technology may be used to examine the safety and efficacy of drugs, chemicals, food supplements and nutraceuticals (Roy *et al*., 2004). In summary, agricultural, food, and biomedical biotechnology continue growing as a nonstop to change our life, the potential is high that one day our foods will also serve as medicines.

Fig 1 : Tomatoes and salmon are two types of food that researchers have found to contain benefits beyond basic nutrition - in this case, lycopene and omega-3 fatty acids, respectively.

CONCLUSION

Nutraceuticals are of great importance in present system of Medical and Healthcare. The lack of quality control is a major area of concern for nutraceuticals. The quality of plant material and manufacturing processes used for nutraceuticals are regulated by food laws, which lack the specificity
required for botanical drugs. This can have serious consequences. Nutraceutical professionals and regulatory bodies need to play a major role for safety maintenance and advances of nutraceuticals.

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